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EXAMINER	
LEUNG, CHRISTINA Y	
ART UNIT	**PAPER NUMBER**
2633	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/025,466	Applicant(s) KUROSHIMA, JUN	
	Examiner Christina Y. Leung	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 26 December 2001.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 4-9 is/are allowed.

6)☒ Claim(s) 1-3 and 11-21 is/are rejected.

7)☒ Claim(s) 10 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 26 December 2001 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 9-16-04.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because:

Based on Applicant's specification (particularly on page 13, lines 15-18), Figure 5 should not be labeled "Prior Art."

Also based on Applicant's specification on page 18, lines 8-15, Examiner respectfully notes that element 3b in both Figures 8 and 9 should be labeled "OSW" instead of "CPL" (since it is a switch, not a coupler) and element 3a in Figure 9 should be additionally changed to element 2d and labeled "CPL" (since it is a coupler, not a switch).

2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamanaka et al. (US 6,201,635 B1).

Regarding claim 1, Yamanaka et al. disclose an optical signal receiving system (Figures 2-4) in which a receiving signal light which is transmitted through a single mode fiber having a zero-velocity-dispersion wavelength and has a wavelength different from the zero-dispersion wavelength (column 1, lines 19-67), is received while performing dispersion compensation on the signal light, the system comprising:

optical receiving means (optical/electrical converter 26 in Figure 2); and

automatic optical level adjustment means (such as in back-end optical amplifier 32, shown in Figure 3 and in greater detail in Figures 4 and 5; column 5, lines 11-15) for automatically adjusting always to a predetermined level the level of optical signal to be received by the optical receiving means when the amount of dispersion compensation on the signal light is newly set (by dispersion compensating fiber DCF, also shown in Figure 3).

Examiner notes that the system disclosed by Yamanaka et al. includes a "through" pathway (shown in Figure 3) that bypasses the dispersion compensation element, but they disclose that a signal which is transmitted through a single mode fiber having a zero-velocity-

dispersion wavelength and has a wavelength different from the zero-dispersion wavelength (such as recited in the claims) would be sent through the dispersion compensation pathway instead (since that type of signal would be affected by dispersion; column 2, lines 16-35).

Regarding claim 3, Yamanaka et al. disclose the predetermined level is of an optimum light receiving level of the light receiving means (column 5, lines 11-33; column 9, lines 10-14).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka et al. in view of Sugaya et al. (US 5,966,237 A).

Regarding claim 2, Yamanaka et al. do not specifically disclose that the optical signal is a wavelength multiplexed optical signal. However, wavelength multiplexed signals are well known in the art as a way to transmit larger amounts of data along a common transmission path. Furthermore, Sugaya et al. teach a system related to the one disclosed by Yamanaka et al. including receiving a wavelength multiplexed optical signal, and providing dispersion compensation and automatic level adjustment for the signal (Figure 13; column 14, lines 61-67; column 15, lines 1-47). Sugaya et al. further teach providing a plurality of the light receiving means 126 and providing the automatic optical level adjustment means 128 in combination with each of the plurality of the light receiving means (Figure 29; column 21, lines 10-30).

It would have been obvious to a person of ordinary skill in the art to use a wavelength multiplexed optical signal and a plurality of light receiving means as taught by Sugaya et al. in the system disclosed by Yamanaka et al. in order to transmit larger amounts of data in multiple wavelength channels and then properly receive each channel at its own receiver. It also would have been obvious a person of ordinary skill in the art to further provide an automatic optical level adjustment means in combination with each of the plurality of the light receiving means as taught by Sugaya et al. in the wavelength multiplexed system described by Yamanaka et al. in view of Sugaya et al. in order to individually optimize the power level of each channel in the multi-channel signal (Sugaya et al., column 21, lines 10-30).

7. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka et al. in view of Sugaya et al. as applied to claim 2 above, and further in view of Mizrahi (US 6,198,556 B1).

Regarding claims 11-13, Yamanaka et al. in view of Sugaya et al. describe a system as discussed above with regard to claim 2. Yamanaka et al. disclose a repeater 12 including dispersion compensation elements as discussed above with regard to claim 1 (Figure 2), but they do not specifically disclose dispersion-compensating light receiving means forming a plurality of stages.

However, it is well known in the art that an optical communication system may include several repeater stages for conditioning a transmitted optical signal over a long distance, and Sugaya et al. further teach providing multiple stages (Figure 25), whereby each stage includes elements such as shown in Figure 13, including:

dispersion compensation means 100 for performing dispersion compensation on the wavelength-multiplexed input signal light; and

the automatic optical level adjustment means 66 through which output light from the dispersion compensation means is transmitted (via DCF loss correction circuit 102 as shown in Figure 13).

Sugaya et al. further teach the dispersion-compensating light receiving means in the plurality of stages are generally connected in cascade form, in the sense that the next dispersion-compensating light receiving means receives the output from the previous stage.

It would have been obvious to a person of ordinary skill in the art to provide multiple stages of dispersion compensation and automatic level adjustment means as further taught by Sugaya et al. in the system described by Yamanaka et al. in view of Sugaya et al. in order to provide accurate adjustments to signal dispersion and level when the signal is transmitted over a long distance.

Sugaya et al. do not specifically further teach that the stages include wavelength demultiplexing means for separating output light from the automatic optical level adjustment means into first light which is signal light of a particular wavelength and second light left after removal of the first light; and

the light receiving means for receiving the first light,

wherein the dispersion-compensating light receiving means in the plurality of stages are connected in cascade form such that the second light in one of the stages is supplied as the input signal light to the dispersion compensation means in the following stage.

However, dropping and receiving wavelengths in the middle of a wavelength multiplexed transmission path is well known in the art, as Mizrahi teaches (Figures 1, 3, and 7). Mizrahi particularly teaches separating light into first light which is signal light of a particular wavelength and second light left after removal of the first light; and the light receiving means for receiving the first light (column 2, lines 40-50 and lines 63-67; column 3, lines 1-40).

Regarding claims 12 and 13 in particular, Mizrahi teaches that the wavelength demultiplexing means comprises a fiber grating for reflecting the first light, and an optical circulator having three terminals (Figure 7; column 5, lines 12-39).

Regarding claims 11-13, it would have been obvious to a person of ordinary skill in the art to further include wavelength demultiplexing means and light receiving means as taught by Mizrahi in the system suggested by Yamanaka et al. in view of Sugaya et al. in order to extract and receive an individual wavelength at a node and thereby provide communications to additional users (i.e., other than at the endpoint destination already disclosed by Yamanaka et al. or taught by Sugaya et al.).

Regarding claims 14-16, as similarly discussed above with regard to claim 11, Yamanaka et al. in view of Sugaya et al. describe a system as discussed above with regard to claim 2. Yamanaka et al. disclose a repeater 12 including dispersion compensation elements as discussed above with regard to claim 1 (Figure 2), but they do not specifically disclose dispersion-compensating light receiving means forming a plurality of stages.

However, it is well known in the art that an optical communication system may include several repeater stages for conditioning a transmitted optical signal over a long distance, and Sugaya et al. further teach providing multiple stages (Figure 25), whereby each stage includes

elements such as shown in Figure 13, including dispersion compensation means 100 for performing dispersion compensation on the wavelength-multiplexed input signal light.

Sugaya et al. further teach the dispersion-compensating light receiving means in the plurality of stages are generally connected in cascade form, in the sense that the next dispersion-compensating light receiving means receives the output from the previous stage.

It would have been obvious to a person of ordinary skill in the art to provide multiple stages of dispersion compensation and automatic level adjustment means as further taught by Sugaya et al. in the system described by Yamanaka et al. in view of Sugaya et al. in order to provide accurate adjustments to signal dispersion and level when the signal is transmitted over a long distance.

Sugaya et al. do not specifically further teach that the stages include wavelength demultiplexing means for separating output light from the dispersion compensating means into first light which is signal light of a particular wavelength and second light left after removal of the first light; and

the light receiving means for receiving the first light,

wherein the dispersion-compensating light receiving means in the plurality of stages are connected in cascade form such that the second light in one of the stages is supplied as the input signal light to the dispersion compensation means in the following stage.

However, dropping and receiving wavelengths in the middle of a wavelength multiplexed transmission path is well known in the art, as Mizrahi teaches (Figures 1, 3, and 7). Mizrahi particularly teaches separating light into first light which is signal light of a particular

wavelength and second light left after removal of the first light; and the light receiving means for receiving the first light (column 2, lines 40-50 and lines 63-67; column 3, lines 1-40).

Regarding claims 15 and 16 in particular, Mizrahi teaches that the wavelength demultiplexing means comprises a fiber grating for reflecting the first light, and an optical circulator having three terminals (Figure 7; column 5, lines 12-39).

Examiner notes that as similarly discussed above with regard to claim 2, Sugaya already teaches providing automatic optical level adjustment means 128 in combination with each of the plurality of the light receiving means in order to individually optimize the power level of each channel in the multi-channel signal (column 21, lines 10-30).

Regarding claims 14-16, it would have been obvious to a person of ordinary skill in the art to further include wavelength demultiplexing means and light receiving means as taught by Mizrahi in the system suggested by Yamanaka et al. in view of Sugaya et al. in order to extract and receive an individual wavelength at a node and thereby provide communications to additional users (i.e., other than at the endpoint destination already disclosed by Yamanaka et al. or taught by Sugaya et al.).

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka et al. in view of Sugaya et al. as applied to claim 2 above, and further in view of Naito (US 5,877,879 A).

Regarding claim 17, Yamanaka et al. in view of Sugaya et al. describe a system as discussed above with regard to claim 2, including a wavelength multiplexed signal. Sugaya et al. further teach (Figure 29) that the system includes:

wavelength demultiplexing means 125 for obtaining parallel wavelength demultiplexing outputs from a wavelength-multiplexed input signal;

a plurality of the automatic optical level adjustment means 128 through each of which output light from the demultiplexer is transmitted; and

a plurality of the light receiving means 126 each for receiving output light from the corresponding one of the automatic optical level adjustment means.

Again, it would have been obvious to a person of ordinary skill in the art to use a wavelength multiplexed optical signal and a plurality of light receiving means as taught by Sugaya et al. in the system disclosed by Yamanaka et al. in order to transmit larger amounts of data in multiple wavelength channels and then properly receive each channel at its own receiver. It also would have been obvious a person of ordinary skill in the art to further provide an automatic optical level adjustment means in combination with each of the plurality of the light receiving means as taught by Sugaya et al. in the wavelength multiplexed system described by Yamanaka et al. in view of Sugaya et al. in order to individually optimize the power level of each channel in the multi-channel signal (Sugaya et al., column 21, lines 10-30).

Sugaya et al. do not specifically further teach a plurality of dispersion compensation means for performing the dispersion compensation on the output light from the wavelength demultiplexing means. However, Naito teaches a system related to the one suggested by Yamanaka et al. in view of Sugaya et al. including providing dispersion compensation to a wavelength multiplexed signal. Naito further teaches providing dispersion compensation to individual channels after the channels are demultiplexed but before they are received at

corresponding light receiving means (using dispersion compensation means 44-1..n in Figures 14-17; column 8, lines 44-67; column 9, lines 1-36).

It would have been obvious to a person of ordinary skill in the art to include a plurality of dispersion compensation means after the demultiplexing means as taught by Naito in the system described by Yamanaka et al. in view of Sugaya et al. in order to individually optimize the dispersion compensation of each channel in the multi-channel signal.

9. Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka et al. in view of Sugaya et al. and Naito as applied to claim 17 above, and further in view of Alexander et al. (US 6,281,997 B1).

Regarding claims 18-21, Yamanaka et al. in view of Sugaya et al. and Naito describe a system as discussed above with regard to claim 17 including a wavelength demultiplexing means as taught by Sugaya et al. Sugaya et al. do not further teach details of the demultiplexer design, but various implementations of wavelength demultiplexing means are well known in the art.

Alexander et al. particularly teaches a wavelength demultiplexing means related to the one already in the system suggested by Yamanaka et al. in view of Sugaya et al. and Naito (Figures 1, 2, and 6-8).

Regarding claim 18 in particular, Alexander et al. teach wavelength demultiplexing means comprising an arrayed waveguide Bragg diffraction grating type of wavelength demultiplexing device (column 6, lines 53-67; column 7, lines 1-18).

Regarding claim 19 in particular, Alexander et al. teach wavelength demultiplexing means comprises a wavelength demultiplexing device having a plurality of stages formed by optical filters using a dielectric multilayer film (column 3, lines 48-67).

Regarding claims 20 and 21 in particular, Alexander et al. teach wavelength demultiplexing means comprises a device having a plurality of stages each formed of a combination of a fiber grating and an optical circulator having three terminals (column 5, lines 57-67; column 6, lines 1-14).

Regarding claims 18-21, it would have been obvious to a person of ordinary skill in the art to implement the wavelength demultiplexing means in the various ways taught by Alexander et al. in the system described by Yamanaka et al. in view of Sugaya et al. and Naito as an engineering design choice of known ways to properly provide the demultiplexing function already established in the suggested system. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

Allowable Subject Matter

10. Claims 4-9 are allowed.

11. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

The prior art, including Yamanaka et al., Sugaya et al., Naito, and Alexander et al., does not specifically disclose or fairly suggest an automatic optical level adjuster including the particular combination of all the elements, functions, and limitations recited in claims 4-10, particularly including a variable optical attenuator, a variable optical amplifier, an optical switch means, and a control means controlling the level of output light connected in the specific way

recited wherein the switch is controlled based on comparison information obtained by comparing the level of the input light with a preset level, and the attenuator and amplifier are controlled based on comparison information obtained by comparing the level of light output from the output optical path with a preset level.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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